Remarks

We have amended the Specification and a number of the Claims to place them into a form compatible with U.S. Rules of Practice. We respectfully request passage to the appropriate art unit for examination.

Respectfully submitted,

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In the Specification (Clean Copy as Amended)

Before the first paragraph on page 1, please insert the following heading:

a1 **FIELD OF THE INVENTION**

Before the second paragraph on page 1, please insert the following heading:

a2 **BACKGROUND**

Please replace the second paragraph on page 1 with the following:

a3 The resolution capability of optical imaging systems is often decisively determined by the object-side aperture of an objective lens and its index of refraction. Light going out from an object can only be detected if it hits the objective within the acceptance angle of the objective. The higher the resolution capability is, the higher the space frequencies of the object structure to be imaged which can be detected. The detection of the space frequencies is described by the light-optical transfer function or modulation transfer function (in the following: OTF) of the optical systems. The OTF indicates which space frequencies, from which the object can be constructed by means of Fourier transformation, are retained in the optical imaging, and/or how parts of the space frequencies are attenuated. The resolution capability of the optical system (e.g. a light-optical microscope) is determined by the range in which the OTF of the system does not vanish. If the OTF vanishes completely in sections of reciprocal space, it is impossible, without additional assumptions about the object structure (e.g. spatial limitation, positivity), to reconstruct the corresponding space frequencies in an object image. There is general interest in the extension of the OFT in the largest possible region in reciprocal space, in order to increase the resolution of the optical system.

Before the paragraph spanning pages 4 and 5, please insert the following heading:

a4 **OBJECTS**

Please delete the first full paragraph on page 5.

Before the second full paragraph on page 5, please insert the following heading:

a5 **SUMMARY OF THE INVENTION**

Before the third full paragraph on page 9, please insert the following heading:

a6 **BRIEF DESCRIPTION OF THE DRAWINGS**

Before the first full paragraph on page 10, please insert the following heading:

a7 **DETAILED DESCRIPTION**

<u>In the Claims</u> (Clean Copy as Amended)

a8

1. (Amended) A process for obtaining an object image of at least one object comprising capturing at least two partial images of the object under differing object conditions which are formed on the object with spatial patterns, wherein non-linear dependence of the light detectable from the object point on the object conditions obtained at the object point exists and the partial images contain different contributions of various space frequency components of the object structure, and determining the desired object image from the partial images by reconstruction of the space frequency components.

2. (Amended) The process according to claim 1, wherein spatial patterns of at least one object condition are formed, for each of which the non-linear dependence of the detected light emitted from the object point exists.

3. (Amended) The process according to claim 1, wherein spatial patterns are formed by at least two object conditions, for which a dependence of the detected light on a multiplicative linking of the object characteristics and a linear or a non-linear dependence of the detected light on each of the object conditions exists.

4. (Amended) The process according to claim 1, 2 or 3, wherein the spatial pattern is given by a pattern of an illumination intensity on the object and the object is illuminated with the pattern of the illumination intensity in such a way that a non-linear dependence of the light intensity, detected at a detector device, coming out from an object point to the illumination intensity obtained at this object point exists.

5. (Amended) The process according to claim 1, 2 or 3, wherein the non-linear dependence of the detected light is formed by a saturation of fluorescence light of fluorophors under intensive illumination, a saturation of the absorption of illumination light under intensive illumination, a dependence of the phase of the emitted or scattered light on the illumination intensity present in the object, SHG or THG processes, a dependence of the light characteristics of the Raman scattering on the value of one or more object characteristics, temporally coherent effects on atoms or molecules in the object, multiphoton absorption, CARS processes, stimulated emission, population of longer-lived states or chemically altered states, radiative or radiation-free energy transfer processes of fluorophors to neighboring fluorophors, nonhomogeneous electric or magnetic fields obtaining at the object point, pressures, shear forces, or mechanical tension relationships obtaining at the object point, temperatures obtaining at the object point, chemical relationships obtaining at the object point, and/or additional object irradiations with electromagnetic rays or sound waves.

a8 cont

6. (Amended) The process according to claim 1, 2 or 3, wherein the spatial pattern of an object condition in reciprocal space can be described or approximately described by a number of points which are distributed in one, two, or three dimensions, or is formed spatially periodically or approximately periodically in one or more dimensions in the location space.

7. (Amended) The process according to claim 1, 2 or 3, wherein the object and the spatial pattern are displaced in one or more directions relative to one another to achieve various object conditions.

a8 cont

8. (Amended) The process according to claim 7, wherein the pattern is generated by a mask or by interference and a displacement of the mask is achieved by displacement of the phase of various diffraction maxima.

9. (Amended) The process according to claim 1, 2 or 3, wherein the object conditions are changed according to a predetermined temporal structure and the partial images are taken at various times.

10. (Amended) The process according to claim 9, wherein the illumination intensity is varied to generate different object conditions.

11. (Amended) The process according to claim 1, 2 or 3, wherein the reconstruction of the object image from the partial images is performed by solving an equation system, taking into account the non-linear dependencies, or by an iterative procedure.

12. (Amended) The process according to claim 1, 2 or 3, wherein the position of the object or one or more partial objects of the object is established.

13. (Amended) The process according to claim 1, 2 or 3, wherein the reconstruction of the object image is performed by consideration of a previously known structure of the object or of parts of the object.

a8 cont

14. (Amended) An optical imaging system comprising an illumination device and a detector device arranged for illuminating an object and recording an image of the object or of parts of the object, at least one pattern generator for generating at least one changeable spatial pattern of object conditions on the object, with the illumination device and/or the pattern generator arranged for generating object conditions on which the light detectable by the detector device is nonlinearly dependent, and an image generator for reconstruction of an object image from partial images which were recorded with the detector device.

15. (Amended) The optical system according to claim 14, wherein the pattern generator comprises a mask with which a spatial pattern of an illumination intensity can be formed on the object.

16. (Amended) The optical system according to claim 15, wherein the mask comprises a multidimensional diffraction grating, a phase grating, a DMD device, or an LCD matrix.

17. (Amended) The device according to claim 15 or 16, wherein the mask and the sample are positioned so they are movable and/or rotatable relative to one another.

18. (Amended) The optical system according to claim 14, wherein the pattern generator comprises a mirror assembly arranged for generating an interference pattern on the object.

19. (Amended) The optical system according to claim 14, wherein the pattern generator comprises a device for achieving predetermined physical or chemical conditions on the object corresponding to the spatial pattern.

a8 cont'd

20. (Amended) The optical system according to claim 14, wherein an adjustment device for displacement of the object in the spatial pattern of the object conditions is provided.

21. (Amended) The optical system according to claim 14, 15, 16, 19 or 20, wherein the illumination device comprises a flash lamp, a laser, or a high-pressure lamp.

22. (Amended) The optical system according to claim 14, 15, 16, 19 or 20, wherein an illumination optic and/or an imaging optic are provided.